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slightly; and the occasional small electrostatic spark from the surface of the tube to the hair, but which was hardly noticeable, will also not account for this effect. JOHN DANIEL.

PHYSICAL LABORATORY,
VANDERBILT UNIVERSITY, March 23, 1896.

INSTINCT.

TO THE EDITOR OF SCIENCE: Having read with considerable interest the discussions under *Instinct*, and having noticed the different opinions expressed concerning the eating and drinking of the chick, I thought that perhaps my personal experiments in regard to the matter might be of interest.

About eight years ago I was desirous of studying the chick before and after hatching, and for this purpose I placed about three hundred eggs in an incubator. I shall confine myself to those that were allowed to hatch.

Those that hatched were divided into two groups, an unhealthy and a healthy group. Those in the first group were fed and given water until they became strong enough to care for themselves. Those in the second group had food and water placed so that they could get them, but they were not fed nor given water, nor were they taught how to secure food and water. No tapping on the dish or on the floor, and no putting of the bill in the food or water was practiced. They were left entirely to themselves.

By watching these chicks, I noticed that they would occasionally run over their food and water, and frequently they stumbled in them. If the beak became wet, up would go the head, and the water was swallowed. If food adhered to the beak, some would get on the tongue, and it would be swallowed. In time they seemed to recognize that the food and water were palatable by repeatedly stumbling in them and getting them on the beak, and finally they learned how to secure them, *i. e.*, how to pick them up. I noticed that at first they did not know how to pick up, but, after repeatedly trying, they learned how. The majority of these chicks lived and developed.

Now if we consider the attempt to pick up, from observation I conclude that it was by *instinct*; but if we consider the picking up, I conclude that it was an *acquired* characteristic.

In conclusion, I might say that at the end of the third day all of the chicks—about fifty—instinctively attempted to pick up, and that at the end of the fifth day they were able to pick up and place the food or water so that it could be swallowed. J. C. HARTZELL, JR.

ORANGEBURG, S. C., March 25, 1896.

VISUALIZATION AND RETINAL IMAGE.

A STORY which has been going the rounds of the press about a successful attempt by Mr. Engles Rogers at photographing his own retinal image of a dead child, said image being produced by visualizing effort, induces me to suggest through SCIENCE that the subject is worthy of more thorough investigation than it has yet received. What effect also hallucination has upon the retina might be determined from study of insane patients dead from hallucinatory fright, etc. In some cases of sudden death by accident there seems to be evidence of a persistence of retinal image; and it seems highly desirable that hospital surgeons should have a simple instrument for investigating such cases. An image which should represent other scenes than the surroundings at time of death might be evidence for mere visualization effecting a retinal image.

HIRAM M. STANLEY.

LAKE FOREST, ILL.

NAVAL EROSION.

TO THE EDITOR OF SCIENCE: An interesting locality for obtaining some measure of the interference of navigation with the normal geological cycle is the Kennebec River, in Maine. Several summers ago, chancing upon this river, I was struck with the completeness of the phenomena of erosion produced by our steamer in disturbing the water.

This stream is an estuary for nearly forty miles from its mouth. It has numerous islands and in many places steep banks. There is a vast amount of glacial material strewn along its shore which, with the matter brought down stream, has silted the river bottom completely. I noted all along the shore that the water in advance of the steamer rose slightly on the bank, but was immediately drawn back to fill the space just occupied by the boat. At some points this recession amounted to fifteen or twenty feet, and at no place was it less than

two feet. I could hear a pronounced rattle as the material was dragged down the shore, and several boulders as big as hen's eggs were rolled three to four feet. Following the withdrawal of the water was a series of waves produced by the prow and sides of the boat. These waves, some of which were a foot high, occurred in sets of three, three more noticeable sets, followed by many smaller ones. They sorted material up to the size of a walnut.

In streams, such as this one, which form the paths of commerce for many cities, the erosion produced by the combined passage of craft of all kinds must be a not-inconsiderable factor.

G. W. TOWER.

U. S. GEOLOGICAL SURVEY, Washington, D. C.

SCIENTIFIC LITERATURE.

The Polar Hares of Eastern North America, with Descriptions of New Forms. By SAMUEL N. RHOADS. Am. Naturalist, March, 1896, pp. 234-239.

The Polar Hare of North America was separated from that of Scandinavia by Leach as long ago as 1819, since which date its specific distinctness has been admitted by nearly all mammalogists. Still, Mr. Rhoads finds it necessary to reëstablish its claim to recognition, and also to drop the time-honored name *glacialis* conferred by the naturalist Leach, who described it, and to substitute therefor the name *arcticus*, under which it was mentioned by Capt. John Ross, commander of the expedition which brought back the specimen. Capt. Ross was not a naturalist and made no claim to technical knowledge of zoölogy, but in his report on the expedition he mentioned, under the heading 'Zoölogical Memoranda,' a number of mammals and birds. Among these the Polar Hare naturally found a place. His brief account of this animal begins with the words: 'Species *Lepus arcticus*, Leach,' from which it is to be inferred that Leach, who gave him the name, at that time intended to use it. Capt. Ross stated further: "Dr. Leach thinks it [the Polar Hare of Baffin Land] to be very distinct from the common White Hare of Scotland (*Lepus albus*, Brisson) and equally so from the *Lepus variabilis*, Pallas. See Appendix, No. V."—showing that all he knew of the animal

came from Leach. Leach contributed to Capt. Ross' report a chapter entitled, 'Descriptions of the New Species of Animals Discovered by His Majesty's Ship Isabella in a Voyage to the Arctic Regions' (Vol. II., pp. 169-179). Leach's name *glacialis*, followed by a Latin diagnosis and English description, occurs on page 170, while the name *arcticus*, as published by Ross, is on page 151 of the same volume.

Briefly stated, the facts seem to be these: Leach, the naturalist, discovered that the American Polar Hare is different from the European and described it under the name *arcticus*, which name he changed before the report was printed, perhaps while it was passing through the press, to *glacialis*. Capt. Ross published the name and facts communicated to him by Leach, and the sequence of chapters gave him twenty pages priority. The question is, shall the name of a new species, given by a naturalist of repute and accompanied by a proper diagnosis, be set aside because an accident of sequence brings another name a few pages earlier in the same publication. This question Mr. Rhoads answers in the affirmative. The verdict of other naturalists on the same point is of interest. A hasty examination of the literature shows that ten persons have used the name *arcticus*, while thirty-six have used the name *glacialis*, as follows:

AUTHORS WHO MENTION THE AMERICAN POLAR HARE UNDER THE NAME ARCTICUS.

Ross, 1819	Trouessart, 1880
Gray, 1843, 1867	Coues, 1884
Gerrard, 1862	Murdoch, 1885
Fitzinger, 1867	True, 1887
Allen, 1875, 1877	Rhoads, 1896

AUTHORS WHO MENTION THE AMERICAN POLAR HARE UNDER THE NAME GLACIALIS.

Leach, 1819	Gray & Ray, 1850
Sabine, 1823	Audubon & Bachman, 1854
Jameson & Scoresby, 1823	Baird, 1857
Parry, 1824	Osborn, 1859
Richardson, 1825, 1829	Bernard J. Ross, 1862
1836, 1839	
Harlan, 1825	Murray, 1866
J. C. Ross, 1825, 1826	Chenu, 1867
Godman, 1826	Brown, 1868, 1875
Lesson, 1827, 1842	Dall, 1870
Hamilton Smith, 1827	Allen, 1871